REMARKS

Claims 1-32 are currently pending in the present application. Claims 1-32 were rejected. Claims 1, 6, 20, 15, 29, and 30-32 are amended by present response. Support for these amendments in the specification is identified below.

Claim Rejections under 35 U.S.C. § 102

Claims 1, 15, 29, and 32 (that is, each of the independent claims) were rejected under 35 U.SC. 102(a) as being anticipated by U.S. Patent No. 6, 665, 301 to Wu, hereinafter Wu. These rejections are respectfully traversed.

As described in the specification, link aggregation is becoming an increasingly useful tool in providing fast and reliable data transmission across a computer network. Link aggregation is a networking term that refers to using a plurality of network links or ports in parallel or in combination to increase network efficiencies, such as transmission speed and better reliability. According to various embodiments: "The present invention relates broadly to a computer network serving data transmission functions between geographically separated customer sites." (Specif., [0001]). Business customers desire an efficient technique for tunneling packets that are part of a link aggregation across a public computer network. (Specif., [0002]) "Such functionality would allow emulation of point-to-point connection of Etherchannel [Cisco proprietary version of link aggregation] ports through an ISP network without dedicated lines, thus maximizing network usage." (*Id.*) However, current applications for tunneling through a computer network "lack flexibility" and, in a typical ISP, do not support "the point-to-point nature of the protocol semantics of UDLD, PAgP and LACP". Conventional tunneling frameworks "are designed [rather] for handling multicast types of protocols". (Specif., [0003]),

Accordingly, various embodiments of the claimed invention provide techniques for tunneling the links of a link aggregation across a public computer network. (*See* Specif., [0005] through [0009]).

"A significant challenge overcome by the present invention is to process the bundle of [link aggregation] connections from one side of an ISP network to the other. Normally, in prior-art applications, the Etherchannel connection is terminated at one end of an ISP's network." (Specif., [0017]). "In contrast, the present invention preserves the connections in separate channels from end to end across the ISP network. The present invention provides a point-to-point topology within the ISP network, emulating cables that connect individual Etherchannel member ports on customer switches across the ISP network. UDLD, PAgP and LACP exchange protocol data units (PDUs) between each pair of customer switch ports in the Etherchannel through these virtual cables." (Specif., [0018]). "The present invention provides a method of network

provisioning to enable a point-to-point connection across an ISP network between two corresponding ports in an Etherchannel." (Specif., [0019]).

Link Aggregation Control Protocol (LACP), Unidirectional Link Detection (UDLD) and Port Aggregation Protocol (PAgP) are protocols that may be used in creating a link aggregation. According to various embodiments, "Using the present invention, ISPs can provide its customers with end to end UDLD, IEEE 802.3as and/or PAgP link aggregation using existing ISP infrastructure previously used for providing conventional transparent LAN service where link aggregation is used to access the transparent LAN service." (Specif., [0015]).

Applicants believe that the present rejections are improper. However, to facilitate prosecution, amendments have been made to each of the independent claims to clarify various embodiments of the invention. Claim 1, for example, has been amended to recite a method for data transmission across a public computer network, the method comprising

> creating a plurality of tunnels across the public computer network to facilitate a link aggregation between ~~connect~~ a first computer at a first site and [[to]]a second computer at a second site, the plurality of tunnels including a tunnel for each link in the [[a]]link aggregation, said link aggregation implemented through the use of a plurality of transmission protocols ~~capable of simultaneously supporting a plurality of transmission protocols~~;
>
> creating a point to point connection between ~~connecting~~ the [[a]]first computer ~~at a first private network with~~ and the [[a]]second computer ~~at a second private network~~, the connection made in part via the tunnels created across the public computer network; and
>
> transmitting packets end-to-end from the first computer to the second computer, the packets conforming to protocols in the plurality of transmission protocols, in such a manner ~~characterized~~ that data is transmitted from the first computer to the second computer without terminating the connection from the first computer to the second computer at a switch at an inbound edge of the public computer network~~, the packets conforming to protocols in the plurality of transmission protocols~~.

Independent claims 15 and 29. Claim 32 has also been amended to add further claim features relating to link aggregation, and it already recited features relating to a point to point connection. Further, claims 31 and 32 have been amended to clarify certain aspects of the invention.

Support for these amendments can be found throughout the specification, including at paragraphs [0015] to [0020]. These amendments are made for purposes of prosecution, and the Applicants reserve the right to assert the previously pending claims in this or other applications in the future.

Wu, the reference cited as anticipating the independent claims, does not teach the elements of the independent claims. Among other things, Wu simply does not teach a link aggregation. Therefore, Wu cannot, and does not, teach or suggest "creating a plurality of tunnels across the public computer network to facilitate a link aggregation between a first computer at a first site and a second computer at a second site, the plurality of tunnels including a tunnel for each link in the link aggregation".

The Examiner cites Figure 3 and Column 6, lines 50-67 of Wu as teaching creating a plurality of tunnels across a public computer network, the plurality of tunnels including a tunnel for each link in a link aggregation. (Office Action, page 2). The cited section of Wu states:

> For the embodiment of FIG. 3, the bandwidth of a first transmission line 106 is entirely subdivided into a plurality of virtual tunnels 116. For example, the first transmission line 106 may be an OC-3c transmission line subdivided into three disparate virtual tunnels 116, comprising transmission rates of 100 Mbps, 35 Mbps, and 20 Mbps, respectively. To support this configuration, the port 104 includes separate virtual interface 114 for each virtual tunnel 116. The bandwidth of a second transmission line 132 is subdivided into a virtual tunnel 116 and a remaining portion 134 that transmits traffic of the port 104 not designating the virtual tunnel 116. For example, the second transmission line 132 may be an OC-3c transmission line comprising a 20 Mbps virtual tunnel 116. To support this configuration, the port 104 includes separate virtual interfaces 114 for the virtual tunnel 116 and the remaining bandwidth of the transmission line 106. The interface of the remaining bandwidth is illustrated as a physical interface to illustrate that concept. (Wu, Column 6, lines 50-67).

The Examiner contends that the above paragraph teaches a plurality of tunnels, the plurality of tunnels including a tunnel for each link in a link aggregation. However, neither this paragraph nor any other section of Wu makes any reference to link aggregation, much less to facilitating link aggregation by creating tunnels across a public computer network. At best, Wu describes a process where the bandwidth of a transmission line is subdivided into a plurality of virtual tunnels. However, subdividing bandwidth into a plurality of virtual tunnels does not teach or suggest link aggregation because it does not teach or suggest using a plurality of physical links in parallel. Since it does not teach link aggregation, Wu cannot teach providing link aggregation between computers across a public computer network.

For at least the above reasons, Applicants respectfully submit that the rejections under 35 U.S.C. 102 against independent claims 1, 15, 29, and 32 are without basis. Therefore, the Applicants respectfully request that the rejections against these claims be withdrawn.

Claim Rejections under 35 U.S.C. § 103

All of the dependent claims of the present application (claims 2-14, 16-18 and 30-31) were rejected on the basis of obviousness. Claims 2 and 16 were rejected under 35 U.SC. 103(a) as being unpatentable over Wu in view of U.S. Patent No. 6,910,149 to Perloff et al., hereinafter Perloff. Claims 3, 4, 17 and 19 were rejected under 35 U.SC. 102(a) as being unpatentable over Wu in view of U.S. Patent No. 2006/0067317 to Portolani et al., hereinafter Portolani. Claims 5 and 19 were rejected under 35 U.S.C. § 103 as being unpatentable over Wu in view of U.S. Patent Publication No. 2006/0067317 to Engstand et al., hereinafter Engstrand. Claims 6-8, 12-14, 20-22 and 26-28 were rejected under 35 U.S.C. § 103 as being unpatentable over Wu in view of U.S. Patent No. 6,501,749 to Alexander Jr. et al., hereinafter Alexander. Claims 9-11 and 23-25 were rejected under 35 U.S.C. § 103 as being unpatentable over Wu in view of U.S. Patent No. 5,081,621 to Sugimoto, hereinafter Sugimoto. Claims 30-31 were rejected under 35 U.S.C. § 103 as being unpatentable over Wu in view of U.S. Patent No. 7,519,056 to Ishwar et al., hereinafter Ishwar. Applicants respectfully traverse these rejections.

For at least the reasons discussed above with respect to the independent claims, Applicants respectfully submit that the cited references do not teach the elements of the dependent claims. Applicants have reviewed the references cited in connection with the dependent claims, and none of them cures the deficiencies discussed above with regard to the Wu reference. Accordingly, Applicants respectfully submit that the obviousness rejections against dependent claims 2-14, 16-18 and 30-31 should be withdrawn for at least the reasons stated above.

Additionally, Applicants respectfully submit that the cited references do not teach additional features recited in the dependent claims. For example, claims 6-14 and 20-28 recite the detection of multipoint protocol tunneling in connection with the features of the independent claims. In the rejection, the Examiner notes, among other things, that the claims do not define multipoint protocol tunneling. For example, with respect to claims 6 and 20, the Office Action states: "the claim does not specifically define multipoint protocol tunneling, so this process reads on multipoint protocol tunneling, since the process determines which links to send multi-destination data frames through." (Office Action, page 7-8).

Applicants respectfully traverse these rejections, and respectfully submit that given the description of multipoint protocol tunneling provided in the specification, and given the knowledge of those of skill in the art, the nature of multipoint tunneling is sufficiently defined. However, to facilitate prosecution, Applicants have amended claims 6 and 20, from which the other multipoint protocol tunneling dependent claims depend, to recite further features relating to this aspect of the invention. Claim 6 has been amended to recite "wherein multipoint protocol

tunneling comprises the presence and participation of one or more additional entities in a protocol exchange that is meant to occur between two end points". Claim 20 has been amended to add similar limitations.

Support for these amendments can be found throughout the specification, including at paragraph [0021] which states: "[0021] Erroneous network configuration that allows tunneled point-to-point protocol packets to be delivered to many points can lead to serious network issues in the ISP customer's network. Point-to-point tunneled protocols are designed to work between two end points. The presence and participation of a third end point in the protocol interaction can result in the entering an error state in the tunneled protocol's finite state machine, which can in turn lead to disabling of the tunneled protocol together. In the case of LACP or PAgP, this could lead to inability to perform bundling of Etherchannel ports. To decrease link down detection time, UDLD is enabled whenever tunneling of PAgP or LACP is configured."

For at least the above reasons, Applicants respectfully submit that the rejections under 35 U.S.C. 103(a) against the dependent claims should be withdrawn.

Applicants believe all claims now pending in this application are in condition for allowance. Applicants therefore respectfully request that a timely Notice of Allowance be issued in this case. Should the Examiner believe a telephone conference would expedite prosecution of this application, the Examiner is encouraged to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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